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ABSTRACT

This paper discusses technology implementation at Flowing Wells, a 10-school district in Tucson, Arizona. The leadership strategies employed by the assistant superintendent, coupled with the district's core values, brought together a cadre of teachers, parents, and administrators focused on assembling the foundation of the district's technology initiative. Ad hoc committees were assembled around the following four themes: curriculum, business and community partnerships, management and fund procurement, and staff development. After establishing a vision for successful technology implementation, the technology team outlined benchmarks that would reveal the extent to which the written vision was being accomplished. Each committee assessed the needs of its respective areas of concern. The curriculum committee built the district's K-12 technology curriculum around the fundamental paradigm that computers and communications equipment are tools designed to get important tasks accomplished. The business and community partnerships committee sought to find a creative solution to equipment needs through leasing the technology. The management committee assessed the communication needs of the district in addition to aggressively searching for alternative funding sources. The staff development team articulated the goal of guaranteeing quick and effective technology implementation in the classroom; training modules for Microsoft Windows and Office were developed. (AEF)

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Implementing Technology in Flowing Wells Schools: An Analysis of Leadership

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Technology is a liability, not an asset. Stories relating the expensive, difficult, and ineffective implementation of new technologies, specifically computers and communication equipment, in our public schools are all too frequent. Quality computers, within five years, go from top-of-the-line, productive, creative tools to forgotten plastic relics collecting dust. The lure of high technology unfortunately leads many districts into snap decisions that sound fiscal leaders can ill afford to make. Spending huge sums of public money or relying upon repeated bond issues without establishing a clear vision of what successful technological implementation should look like is fiscally, politically and socially irresponsible. Beginning with the end in mind; an oft-cited reference to the work of Steven Covey, is prerequisite in bringing about innovative and effective use of technology that promotes student achievement.

Core Values

Flowing Wells, a ten-school district in Tucson, Arizona, turned first to their written core values when beginning to craft their technology implementation plan. A poster in every class outlines the four values all employees are expected to share. First, all decisions will be student-driven, based on what is believed best for the student. Second, every employee will walk their talk and operate with integrity. Third, all work will be quality-focused, modeling the assumption that if something is worth doing it is worth doing well. Finally, the district will respect the decisions everyone must make to maintain balance in their professional and personal lives.

The public expression of these shared values created a framework facilitating the creation, adoption and implementation of the district's new technology initiative.

Climate for Change

District administrators, through the course of many years, have established communication and trust between themselves and the governing board they are accountable to. Board members and administrators strengthen this communication during annual summer retreats. At the start of fiscal year 1997, all decision-makers in the district were ready and willing to move forward with a new technology initiative. Additionally, a successful salary override recently raised teacher pay comparable to neighboring districts.

The importance of governing board, community and teacher support cannot be overlooked when considering the adoption of expensive new policies. The pacing and timing of major change efforts contribute tremendously towards their success or failure.

Collaboration

The leadership strategies employed by assistant superintendent, Dr. John Pedicone, coupled with the district's core values, articulated by superintendent, Dr. Phil Corkill, brought together a cadre of teachers, parents and administrators focused on assembling the foundation of the district's technology initiative. Under Dr. Pedicone's supervision, ad hoc committees were assembled around the following four themes:

- Curriculum
- Business and Community Partnerships
- Management and Fund Procurement
- Staff Development

Individuals with key interests in each area were selected and asked to staff each respective committee. From the inception of the project there was a high degree of congruency between the skills of the committee members and the tasks that were required of them. Throughout the summer of 1997, the intrinsic motivation inherent in the opportunity to build their own future, fueled the committees' efforts and ultimately led to the success of the initiative.

Flowing Wells' Vision for Technology

Guided by articulated core values, the technology team set out first to envision what successful technology implementation should look like. Incorporating the driving themes of each ad hoc committee, the team generated a vision statement that would serve to guide all their future decisions.

Flowing Wells intends to assess, acquire and implement technology designed to enrich instruction and achievement,

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and will provide staff and students with the skills and opportunities needed to excel in the 21st century.

Only by clarifying what ultimately is desired can effective task-analysis be undertaken. The committees, as they endeavored to construct their portion of the technology plan, never lost sight of how their work integrated with that of the whole.

Benchmarks of Success

Vision and dreams without links to practical, visible measures of success have often derailed otherwise noble efforts at improving instruction, and ultimately, student achievement. To avoid this, the technology team established benchmarks that would truly reveal the extent to which the written vision was being accomplished.

- Every student will have access to appropriate technology at appropriate levels.
- Every student will have access to computers during and outside of school hours.
- All students and staff will have access to the Internet.
- All students and staff will be able to access information according to individual responsibilities from any location within the district.
- All district functions will be tied together through an effective technology network.
- A coordinated and integrated curriculum will be implemented that will prepare students for the world after graduation.
- An effective, applicable staff development program designed to enrich instruction and achievement will be established.

As the summer and the school year progressed, the technology team kept each other apprised of the progress made on each benchmark. This continued, monthly communication strengthened the integration and support between the ad hoc committees.

Ad Hoc Efforts

Each ad hoc committee faced, at times, daunting challenges, yet careful task-analysis, thoughtful division of labor, and the already described intrinsic motivation provided the opportunity for each committee to succeed. Intrinsic motivation aside, however, the work of some committees called for additional compensation. Core values must be embraced by all parts of a school district, and providing monetary rewards for exceptional leadership and initiative is only right if initiative and leadership are to be expected. The governing board and district superintendents were well-prepared to meet the compensatory need, having already formulated and executed a five-year budgeting plan.

It is a common occurrence in education to expect leadership, initiative, and exceptional performance from individuals provided neither incentive nor opportunity to. In what other occupation does this logical fallacy hold merit? Flowing Wells' decision-makers, in addition to walking their talk of high standards and expectations, enacted that other euphemism for integrity: putting their money where their mouths are.

Each committee, engendered with opportunity, inherent desire for success and respectful compensation, set out assessing the needs of their respective realms of concern.

Curriculum

The curriculum committee, chaired by principal John Black and comprised otherwise entirely of teachers, built the district's K-12 technology curriculum around the fundamental paradigm that computers and communications equipment are tools designed to get important tasks accomplished. Technology should not be an end in and of itself, rather the means to whatever end is called for. Basing instructional guidelines on competencies that clearly define what students at each level will be able to do facilitates a streamlined, integrated K-12 curriculum. Instructional autonomy for individual teachers is preserved by basing competencies on actual skills, not assignments.

Figure 1. K-12 Technology Curricular Outline for Flowing Wells School District

A detailed examination of specific competencies at each level of schooling is beyond the scope of this paper. However, it is important to note that students' mastery of the software and skills taught is assessed through evaluation of projects done for core-curricular content areas such as language arts, math, science, and social studies. By assessing student applications of content taught, Flowing Wells adheres to its core values and the principle that technology is intended to facilitate accomplishment.

Business and Community Partnerships

For five years the technological needs of the district were identified and communicated to the community of Flowing Wells. This continual communication helped secure funding well in advance of the initiative's implementation. Flowing Wells, however, is not a wealthy district, its

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median household income is only $14,580. The majority of families in the district rent, and increases in property taxes due to bond and override efforts are laid squarely on the shoulders of those who do not own the land being taxed.

Typical technology procurements occur in bursts, with huge sums of money being raised and spent every five or ten years. There is no coincidence that procurements tend to follow five or ten year bond cycles. School districts in Arizona, despite the Supreme Court deeming the current capital outlay laws unconstitutional, are forced to rely on increasing the tax burden on the families of the children they serve. The business and community partnerships committee sought to find a more creative solution.

Leasing. Instead of purchasing, at enormous expense, hundreds of computers that will be well on their way to obsolescence in five years, the committee investigated the option of leasing technology. Through the local affiliate of Microage, all legal and financial considerations were explored and documented. Though more expensive than purchasing in interim years, leasing avoids having to drop bond issues every five years on communities which cannot afford them. Additionally, the service provided by Dell Computers and Microage ensures the quality of the product and protects the district from the possibility of wide-spread equipment failures (as occurs frequently when districts low-bid for hardware). The lease is up for renewal every three years, allowing the district to upgrade to new technology as it's made available. The steady fund requirements mandated by leasing facilitate long-term budgeting and expansion planning.

Management and Fund Procurement

Lead by Dr. John Pedicone, the management committee assessed the communication needs of the district in addition to aggressively searching for alternative funding sources such as grants and corporate donations. The committee analyzed the needs of three distinct, yet systemically-tied realms.

Figure 2. Technology Needs Assessment Diagram

With the needs assessments in place for each major sphere of concern, the management committee began structuring future budgeting strategies around the hardware, software, and staff development necessary to achieve the district's goals. This 1/3, 1/3, 1/3 principle ensures that hardware, software and training capabilities will remain aligned and the district's spending balanced.

Connectivity. Quality communication between all ten sites in the district, as well as the vision to fully incorporate the Internet in instruction, mandated the acquisition and installation of T-1 lines throughout the district. Additionally, through strategic integration of wide and limited area networks, the district intends to connect all classrooms and libraries to communication nexus points, facilitating exchange of information. These connections form the skeletal structure of any effective technology plan. A detailed, two-year plan was outlined to insure success of the connectivity component of the initiative.

Many technology plans develop from the top down, bringing in expensive computers and software before establishing the necessary infrastructure that will maintain and support instructional efforts. Flowing Wells, by installing the hard-wiring first, and ensuring its quality and effectiveness, will establish a healthy foundation in which future technologies can be integrated.

The management committee secured $50,000 through a federal grant. The grant included a proviso that mandated installation of communication lines (which the grant is intended to be used for) by the end of the year. Success in this endeavor will allow the district to pursue $100,000 in additional funds. The E-Rate is a communication-equipment grant drawn from the $2.25 billion telecommunications companies across the country have been required to provide public education. The funds are federally allocated based upon a district's percentage of students on free or reduced lunches. Districts like Flowing Wells can benefit greatly from the E-Rate, and build a strong foundation further grants can supplement. The E-Rate funding will enable Flowing Wells to realize their connectivity goals by the end of December, 1998.

Administrative Software. A district wired together with LAN and WAN networks can greatly increase the effectiveness of its inter-district communication. Attendance, discipline and other records can be maintained, updated and accessed with ease from any location within the district. Streamlining record keeping empowers teachers and administrators to better serve their students by freeing up planning time from administrative and disciplinary paperwork. The committee researched and evaluated a variety of administrative software, deciding upon CIMS and SASSI. CIMS and SASSI are designed to keep records on attendance and provide seamless communication with a variety of state institutions. Incorporation of this software will enable Flowing Wells to have a K-12 integrated attendance system in place for the 1998-1999 school year.

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Staff Development

Effective implementation of technology mandates its use and application. Often, however, fancy toys are placed on teacher's desks with the expectation, without any training provided, that the equipment will be utilized effectively. Susie Heintz, staff development coordinator of Flowing Wells, assembled a committee with the articulated goal of guaranteeing quick and effective technology implementation in the classroom. The technology team early on decided upon the purchase of Windows and Microsoft compatible equipment and software. This decision was not made lightly, rather reflecting upon the core values of the district and the prevalence of IBM and Microsoft applications in the work force, it was deemed in the best interests of the students to move away from Macintosh products.

Technology Vanguard. The prior year, with a core group of teachers, some initial training was performed in existing labs. These teachers, known as the Technology Vanguard Team, formed the pool from which the writing and training teams were assembled.

Training Modules. Selected members of the Vanguard Team spent the summer of 1997 writing training modules for Microsoft Windows and Office, specifically Word, PowerPoint and Publisher. Supplementing these core applications, were modules developed for Hyperstudio and Grade Machine +. The modules followed an exacting format and were compiled into a master staff-development handbook. Each module was framed around conceptual elements inherent in each program. These concepts were then broken down into specific objectives, and step-by-step instructions. Each module created the opportunity for participants to make a product for immediate use in their class. Teachers and support personnel walked away from each training seminar with usable material, and as labs were installed month by month across the district, opportunities to continue applying their skills. The modules are of the highest quality, complete with anticipatory sets, guided and individual practice sections, and interactive, step-by-step closures.

Inservices. The modules were structured to cater to a specific level of participant competency. The Windows training, for example, occurred early in the year while the Hyperstudio module was held in February 1998, and required passing a pre-test to attend. The Vanguard trainers attended design review nights held by the staff development coordinator and the writer of the module being examined. The most critical elements of each module were stressed and teaching strategies discussed and refined.

Vanguard members and participants received additional pay for writing, teaching, and attending modules and inservices. Again, this in keeping with the district's core values. The sessions were held in the evenings at a variety of different schools.

Conclusion: An Analysis of Successful Leadership

The Flowing Wells Technology Initiative modeled the Delphi Technique: a leadership strategy that is empowering rather than directive. The district has been aware of the need for improvement in the realm of technology for two years, and this need has been effectively communicated throughout the staff and the community. This legitimacy engendered by open communication, fostered collaboration between district and school administrators, teachers, community leaders, and parents. An appropriate tempo for change was set early on. The big spending push came after a successful override had brought salary comparability to the teachers in the district. Staff development and hardware installation occurred concurrently, well-funded and budgeted early on in the process.

Patience and Problem Solving

Problems were identified, defined and task-analyzed by committees staffed by committed, effective personnel. Realms of concern were identified and systemically examined for inter-relationships and cause-effect scenarios. The team remained focused on the core values of the district and established clear vision and intent allowing success to measured and tracked.

Continuous Improvement

Intense and continued evaluation of each component of the plan lay ahead for Flowing Wells. Each phase in the change process is examined and refined if found wanting. Serious efforts will be paid to the continued development of curriculum that focuses on application. The curriculum instituted at the Junior High is an example of the competency-based, application-oriented approach to technology and technology training the district is looking for. Over time, as kids grow more fluent in the use of computers, the competencies and the levels at which they are mastered will have to be analyzed and adjusted. Continuous improvement, driven by relevancy, is the lens district administrators are using to ensure student achievement.

Final Take

Thomas Edison, at the turn of the century predicted the radio would make schools obsolete by the 1920s. B.F. Skinner, as the Cold War rolled forward, thought television would do in public education and the need for teachers. Now computer, electronic and distance learning champions are heralding our end as well. Dr. Phil Corkill, superintendent of Flowing Wells, however, notes, "What makes a difference will be a teacher, exquisitely trained, who cares about the kids. Our money should go not only to provide our kids technology, but to our teachers, letting them know they're our most vital resource."

Figure 3. Evaluative Realms for Continued Improvement

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